overlaying said image on a background.

Add the following claim:

34. (NEW) Apparatus for compressing an image having at least three textures, comprising:

a microprocessor;

a memory coupled to the microprocessor, the memory being configured to cause the microprocessor to:

a) generate a map representing boundaries separating regions in said image, the map comprising a bitmap, said boundaries comprising pixels;

b) generate pointers, each of said pointers associating one of said regions with one of said textures, said regions comprising pixels; and

c) store the map and the pointers in a memory coupled to the microprocessor.

Remarks

Applicant's responses are set forth below, in each case following a quotation (indented and in bold face small type) of the examiner's comment to which it relates.

1. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

Applicant has amended the title.

2. Claim 32 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

3. Claim 32 recites the limitation said extracting in the second line of claim 32 There is insufficient antecedent basis for this limitation in the claim.

Applicant has amended claim 32.

5. Claims 1-3 are rejected under 35 U.S.C. 103 as being unpatentable over Leach.

For claim 1, Leach provides for compressing an image having at least three textures as shown in Fig. 4, and compression is provided, since codes are used for colors as noted in col. 6, lines 17-19. A generated boundary map separating regions is provided as shown in Fig. 4. Associating regions with textures is provided as shown in Figs. 4 and 5, and as noted in col. 9, lines 5-13, and generating pointers is at least obviously, if not inherently provided, since pointers are variables that contain the address of some data and where the data in this case is texture (colors) which is variably addressable in registers (addressable memory) by a color palette.

Amended claim 1 requires "generating a map representing boundaries separating regions in said image, said map comprising a bitmap, said boundaries comprising pixels of a first value", and "generating pointers, each of said pointers associating one of said regions with one of said textures." One advantage of the claimed invention is that a bit mapped image (e.g., a sprite image) having distinct yet coupled regions of different textures (e.g., patterns of color) can be efficiently compressed in size for storage, and quickly decompressed for display.

By contrast, Leach does not describe or suggest compressing his sprite images; each of his sprites is simply fetched from memory as a horizontal line of bits for each vertical position of the sprite. [Col. 6:67 - Col. 7:2]. Each sprite located on a particular display line has its horizontal line of bits placed in a sprite register 100, using a sprite horizontal pointer 82, pattern register 81, color register 80, and sprite coincidence selection logic 70. The sprite pattern register 81 then shifts bits out serially to the video RAM. [Col. 8:32-40]. Leach does not even hint at generating a bitmap representing boundaries separating regions, let alone generating

pointers, each pointer associating one of the regions with one of the textures, as in claim 1.

> **For claim 2, a bitmap, is provided for in col. 5, lines 42-43. The boundaries comprise pixels of a first value, and the regions comprise other values as provided by example in Figs. 4 and 5.**
>
> **For claim 3, assigning codes to textures is provided for by color codes in col. 6, lines 17 - 19, and in Fig. 11a, where color may be construed as texture - specification page 2, line 22.**

Claims 2 and 3 depend on claim 1 and are patentable for at least the same reasons.

> **6. Claims 1-11, 14-19, 22-23, 27-28, 31, and 33 are rejected under 35 U.S.C. 103 as being unpatentable over Murata et al.**
>
> **For claim 1, compressing an image is provided for, since codes are used for characters and color - col. 30, lines 35-40. A form of compression is also provided for in col. 30, lines 50-52. At least three textures are provided for as shown in Fig. 11 by trees, a brick road, grass, roof tops, etc., and as noted in col. 21, lines 1-11. Generating a boundary map separating regions is shown in Fig. 11. Associating regions with textures is also shown in Fig. 11, and generating pointers for the association is provided in col. 21, lines 20-29, where it is at least obvious, if not inherent that pointers are used, since pointers are variables that contain the address of some data, where in this case the data is texture, and where texture information is written into a buffer which inherently has addresses, and where it is at least obvious if not inherent that this texture data is pointed to by other variables - col. 20, lines 58-62, and where it is further noted that pointers and data structures are conventional codes in a programming language such as "C".**

Murata does not describe or suggest compressing an image as a <u>bitmap</u> of boundaries separating regions and pointers to textures associated with the regions. Murata first generates <u>vector</u> polygonal shapes, transforms the shapes (e.g., to exhibit perspective) and the associated textures, and then applies the transformed textures to the surfaces of these <u>vector</u> polygonal shapes. Murata applies textures to the surfaces generated by a transformed polygon, first to the calculated vertices of the polygon, and then to interpolated points between those vertices. [Col. 3:44 - Col. 4:7, Col. 16:40 - Col. 17:16]:

> The mapping of the texture data to the respective dots of the polygon is performed by specifying only texture

coordinates corresponding to each vertex in the polygon. The mapping of the texture data to dots other than the vertices may be made by interpolating the texture coordinates for each vertex to determine texture coordinates to be applied to the other dots and by reading out texture data through the interpolated texture coordinates. [Col. 17:9-16] (emphasis added).

In Murata, boundary maps are not compressed and stored as bitmaps. The passage at col. 18:20-23, cited by the Examiner, refers to the final generated bitmap of the full video image created by Murata's image synthesis system, not to a boundary map.

For claim 2, a bitmap is at least obviously, if not inherently provided for in col. 18, lines 20-22, since a one-to-one correspondence between display dots (i.e. pixels) and storage areas (implying bits) is the definition of a bit-map. The boundaries comprise pixels of a first value, and the regions comprise other values as provided by example in Figs. 11-13 and 39-40.

[Comments on claims 3 through 11 have been omitted]

Claims 2 through 11 are patentable for at least the same reasons as claim 1.

For claim 14, see above for claims 1-5 and 9.

Claim 14, similar to claim 1, requires "generating a map, the map comprising a bitmap representing boundary pixels of a first one of said textures separating said regions in said image", and is patentable for at least the same reasons.

For claim 15, see above for claim 1, and note that a data structure is at least obviously if not inherently provided by at least the attribute data and the coordinate data for example in col. 16, lines 54-61, and where it is noted that pointers and data structures are conventional codes in a programming language such as "C".

[Comments on claims 16 through 19 have been omitted]

For claim 22, the invention of Murata may be considered decompressing an image having at least three textures, since color codes for example are used to make an image on a CRT as shown in Fig. 9B, and where at least three textures are provided in Figs. 11 and 12. At the least, Murata may be used in a decompression stage. For a region boundary map and a pointer determining textures associated with regions is provided for above in claim 1. Filling a region with texture is provided in col. 18, lines 50-56.

[Comments on claims 23, 27, and 28 have been omitted]

For claim 31, see above rejections for claim 22, and further note that a display is provided for as a CRT as block 46 in Fig. 1B, and overlaying an image on a background is provided as shown in Figs. 10-12.

For claim 33, see above for claims 1 and 31.

Claims 15, 22, 31 and 33 require "a map representing boundaries separating regions" with "said map comprising a bitmap, said boundaries comprising pixels", and are patentable for at least the same reasons as claim 1. Claims 16-19, 23, 27, and 28 are patentable for at least the same reasons as the claims from which they depend.

7. Claims 12-13, 20-21, and 24-26 are rejected under 35 U.S.C. 103 as being unpatentable over Murata et al. in view of Snyder et al. or Golin et al.

[Comments on claims 12-13, 20-21, and 24-26 have been omitted]

8. Claims 29 and 30 are rejected under 35 U.S.C. 103 as being unpatentable over Murata et al. in view of Foley et al.

[Comments on claims 29-30 have been omitted]

9. Claim 32 is rejected under 35 U.S.C. 103 as being unpatentable over Murata et al. in view of Snyder et al.

[Comments on claim 32 have been omitted]

Claims 12-13, 20-21, 24-26, 29-30, 32, and new claim 34 are patentable for at least the same reasons as the claims from which they depend.

Applicant asks that all claims now be allowed.

Apply any charges or credits to deposit account 06-1050.

Respectfully submitted,

Date: 2/11/97

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